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CALCIUM ION CONTENT IN NUTRIENT MEDIUM AND ITS EFFECT ON THE
GROWTH OF THE PLAGUE BACILLUS

(Following is the translation of an article by L. E. Terentyeva,
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in the Russian-language periodical Zh. MEI, (Journal of Micro-
biology, Epidemiology and Immunobiology), No 4, 1967, page 138.
It was submitted on Feb 4, 1966)

It is known that for ensuring the rich growth of virulent cells of
the plague causative agent at 37° the nutrient media should contain no
less than 0.008-0.016% of calcium ions (Higuchi and associates, 1959).

We studied the correlation between the content of calcium and the
growth qualities of nutrient media (at 37°), prepared from pancreatic
hydrolyzates of meat (12 series) and casein (5 series). The content of
calcium in the media was determined by the method of Ward. It was es-
tablished that the content of calcium in Hottinger meat hydrolyzates
comprised on the average 0.002, and in casein - 0.0187%.

On agar media of meat hydrolyzates during seeding of 1000 microbial
cells of the virulent strain of plague microbe No 100, after two days at
28° an average of 327 colonies grew, and at 37° growth was not noted or the
individual colonies did not increase. The addition of calcium chloride to
these media up to a concentration equal to 0.012% lead to a sharp increase
in the yield of colonies of plague microbe at 37°. Agar media made from

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hydrolyzates of casein guaranteed the growth of the plague microbe even without the addition of calcium. The cited data testified to an insufficient content of calcium in meat media for guaranteeing the full-value growth of the plague causative agent at 37°. Besides this the immediate determination of calcium in Hottinger agar showed the high level of this element in the medium - 0.1828%. It is necessary to take into consideration that the amount of calcium in agar meat media consists of calcium of the hydrolyzate (in our case 0.002% of calcium of tap water which was used for the dilution of the hydrolyzate) and calcium of the agar-agar (according to our determinations, in agar gel prepared on bidistilled water it contained more than 0.18% calcium). We propose that in agar-agar the main mass of calcium is contained in a difficult to assimilate form and exerts practically no influence on the growth properties of the medium, and the main mass of calcium ions which are easily assimilable by the plague microbe enter into the nutrient medium with tap water. The study of the growth of the plague causative agent on calcium-deficient media showed that at a temperature lower than 31-32° a deficiency of calcium ceases to exert an influence on growth.